

REMARKS

I. Formalities

Applicants thank the Examiner for acknowledging the claim for priority under 35 U.S.C. § 119, and receipt of the certified copy of the priority document submitted on January 30, 2004.

Applicants thank the Examiner for considering the references cited with the Information Disclosure Statements filed on January 30, 2004 and July 14, 2004, respectively.

Applicants also thank the Examiner for acknowledging the election without traverse of claims 1 and 3 in the Response to Restriction Requirement filed on December 15, 2005.

II. Status of the Application

By the present amendment, Applicants amend claims 1 and 3 for reasons of grammar and clarity. Applicants also add claims 4-7 to more fully cover various implementations of the invention. Claims 1 and 3-7 are all the claims pending in the Application. Claims 1 and 3 have been rejected.

The present amendment addresses each point of objection and rejection raised by the Examiner. Favorable reconsideration is respectfully requested.

III. Objections to the Drawings

The Examiner has objected to the Drawings as failing to comply with 37 C.F.R. § 1.84(p)(5), alleging that they include the reference character "12," which is not mentioned in the specification. Applicants have amended the present specification, as set forth above, to correct the informalities noted by the Examiner. Thus, Applicants respectfully request that the Examiner withdraw these objections.

IV. Claim Rejections under 35 U.S.C. §103

The Examiner has rejected claims 1 and 3 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent Publication No. 2002/0090172 to Okazaki et al. (hereinafter “Okazaki”), in view of U.S. Patent No. 4,360,965 to Fujiwara (hereinafter “Fujiwara”). Applicants respectfully traverse these rejections for *at least* the reasons set forth below.

The Examiner acknowledges that Okazaki fails to teach or suggest the feature of wherein a nitride-based semiconductor laser bar is bonded to a heat sink with a brazing material comprising gold and one of tin and silicon as main components, by pressing the nitride-based semiconductor laser bar toward a fixation surface with a tool having a shape corresponding to the predetermined shape of the fixation surface, during a brazing operation, as recited in claims 1 and 3.

Nevertheless, the grounds of rejection apply Fujiwara, alleging that Fujiwara teaches that a semiconductor laser element 24, which is held to a vacuum collet 41, is placed on the gold-tin alloy layer 36 coating the surface of the heat sink 23, and is pressed thereto by the vacuum collet 41. (Column 5, lines 19-22). Further, the grounds of rejection allege that it would have been obvious to one of ordinary skill in the art to combine the teachings of Okazaki with those of Fujiwara in order to manufacture a semiconductor laser device which is mounted and bonded to a heat sink with a low thermal resistance value and a rigid mechanical coupling property and also to ensure that the semiconductor laser device produces a high output power and has a long operating life for optical communication systems, as taught in column 2, lines 50-54 and lines 59-64 of Fujiwara. Applicants respectfully disagree with the grounds of rejection.

First, Applicants submit that neither Okazaki, Fujiwara, nor any combination thereof, teaches or suggests all the features in claims 1 and 3. In order for the Examiner to maintain a rejection under 35 U.S.C. §103, the cited references, or some combination thereof, must teach or suggest all of the recitations of claims 1 and 3. However, neither Okazaki, Fujiwara, nor any combination thereof, teaches or suggests the feature of “a nitride-based semiconductor laser bar which comprises at least three light-emission points formed on a substrate,” as recited in claims 1 and 3.

In fact, Okazaki teaches quite the opposite—that only a single light-emission point is formed in each of a plurality of semiconductor lasers. (*See* paragraph 0029). In contrast, claims 1 and 3 require that “at least three light-emission points” are formed in a laser bar. Further, as explained in the present specification, a laser bar is a device in which semiconductor layers are formed on a single substrate so as to realize a plurality of light-emission points. (Page 2, lines 7-9). And, in conventional semiconductor laser bars, a plurality of light-emission points are formed by crystal growth on a single substrate and, as a result, a curvature of the array of the plurality of light-emission points is produced and the light-emission points are not aligned properly. (Page 2, lines 10-18). As such, the present invention is directed to solving this problem (and others) by, for example, providing a laser element so that a semiconductor laser bar has a shape which substantially matches with a shape of a surface onto which the semiconductor laser bar is fixed. (Page 5, lines 5-10). However, contrary to the requirements of claim 1 and 3, Okazaki teaches that only a single light-emission point is formed on each semiconductor laser

and, thus, the problem of improper alignment discussed above cannot even occur. (*See* paragraph 0029).

What is more, Fujiwara fails to remedy the deficient teachings of Okazaki. To the contrary, Fujiwara teaches a semiconductor laser element 24 that is a single chip which has a single light-emission point. (Column 4, lines 31-47; Figure 2). Therefore, Fujiwara also fails to teach or suggest the feature of “a nitride-based semiconductor laser bar which comprises at least three light-emission points formed on a substrate,” as recited in claims 1 and 3. Thus, Applicants respectfully submit that neither Okazaki, Fujiwara, nor any combination thereof, teaches or suggests all the features recited in claims 1 and 3, for *at least* these reasons.

Second, Applicants submit that one of ordinary skill in the art would not have been motivated to combine the teachings of Okazaki and Fujiwara in the manner proposed by the grounds of rejection, to arrive at the inventions recited in claims 1 and 3, since one of ordinary skill would not have had any reasonable expectation of success in combining or modifying the references in the specific manner proposed.

Indeed, the Examiner bears the initial burden of establishing *prima facie* obviousness. (MPEP § 2142). To establish a *prima facie* case of obviousness the Examiner must show that there is a reasonable expectation of success in combining or modifying the references in the manner proposed. (See MPEP § 2143).

Here, the grounds of rejection allege that it would have been obvious to one of ordinary skill in the art to use Fujiwara’s process of pressing the semiconductor laser element 24, which is comprised of gallium-arsenic based materials, on the gold-tin alloy layer 36 coating the surface

of the heat sink 23, with the vacuum collet 41, in order to mount the gallium nitride semiconductor laser block taught in Okazaki onto the heat block 10. However, one of ordinary skill in the art would not have had any reasonable expectation of success in modifying the process of pressing the gallium-arsenic based semiconductor laser element 24, as taught in Fujiwara, so as to mount the gallium nitride semiconductor laser block taught in Okazaki.

To the contrary, as explained in the present specification, for example, one of ordinary skill in the art would have recognized that nitride-based semiconductor laser bars, like those taught in Okazaki, generally have higher rigidity than the gallium arsenic based semiconductor laser bars, like those taught in Fujiwara. (Page 3, line 26 – page 4, line 4). Thus, as explained in the present specification, one of ordinary skill in the art would recognize that it is impossible to deform each nitride-based semiconductor (such as those taught in Okazaki) so as to have a shape equivalent to the surface of a heat sink. (Page 4, lines 5-7).

Indeed, as taught in Fujiwara, a semiconductor laser is secured to a heat sink by pressing, with a collet, only the center (or its vicinity) of the semiconductor laser. (Page 4, lines 5-12). However, even if one of ordinary skill were motivated to press the laser bar taught in Okazaki, using a collet to press only the center (or its vicinity) of the semiconductor laser bar, as taught in Fujiwara, it would be impossible to deform the laser bar so as to have a shape corresponding to the surface of the heat sink, as described in the present specification on page 4, lines 5-12.

Therefore, one of ordinary skill in the art at the time of the present invention would not have had any reasonable expectation of successfully applying the center pressing techniques used for pressing low rigidity the gallium arsenic based semiconductor laser bars, as taught in

Fujiwara, to deform higher rigidity nitride-based semiconductors, such as those taught in Okazaki, so as to have a shape equivalent to the surface of a heat sink, as proposed in the grounds of rejection. Therefore, one of ordinary skill in the art would not have been motivated to combine the teachings of Okazaki and Fujiwara and claims 1 and 3 are patentable over the cited references for *at least* these reasons.

V. New Claims

Applicants hereby add new dependent claims 4-7. Applicants submit that claims 4-7 are fully supported *at least* by Figure 1A and page 2, lines 7-9 of the originally filed specification. No new matter has been added. Applicants submit that claims 4-7 are allowable *at least* by virtue of their dependency and by virtue of the recitations set forth therein.

VI. Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

AMENDMENT UNDER 37 C.F.R. § 1.111
U.S. Appln. No.: 10/766,808

Attorney Docket No. Q79650

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.


Respectfully submitted,

SUGHRUE MION, PLLC
Telephone: (202) 293-7060
Facsimile: (202) 293-7860

WASHINGTON OFFICE

23373

CUSTOMER NUMBER



Andrew J. Taska
Registration No. 54,666

Date: April 13, 2006

AMENDMENTS TO THE DRAWINGS

Applicants enclose herewith a Replacement Sheet for Figure 2, which corrects various minor informalities. In particular, the reference characters “/1” and “/2” have been changed to “d1” and “d2,” respectively. Applicants respectfully request that the Examiner approve this drawing.

Attachment: 1 Replacement Sheet (Figure 2).